LESSON MAKER PRO

Sample Showdown

Use center and spread to compare two populations.

GRADE 7 · 7.SP.B.4

CCSS.Math.Content.7.SP.B.4 "Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example..."

NAME _____ DATE _____

COMPARE THE SAMPLES

Use the mean to compare what is typical in two random samples. Use MAD, or mean absolute deviation, to compare how spread out the values are. A higher mean suggests generally greater values, and a smaller MAD means the sample values are more consistent.

WORKED EXAMPLE

A random sample from Club P has these numbers of completed challenges: 11, 13, 17, 19. Find the mean and MAD.

1. Add the values: 11 + 13 + 17 + 19 = 60.
2. Find the mean: 60 / 4 = 15.
3. Find distances from 15: 4, 2, 2, 4. Their sum is 12.
4. Find the MAD: 12 / 4 = 3.

Answer: Mean = 15; MAD = 3.

PRACTICE 6 problems

1 A random sample has values 4, 6, 8, 10. Find the mean.

ANSWER _____

2 A random sample has values 3, 5, 7, 9. Find the mean and MAD.

ANSWER _____

3 Sample A has values 10, 12, 14. Sample B has values 6, 12, 18. Which sample has the higher mean, or are the means equal?

ANSWER _____

4 Sample C has values 21, 22, 23, 24. Sample D has values 20, 22, 24, 26. Which sample is more consistent? Use MAD to support your answer.

ANSWER _____

5 A random sample from Group Red has values 7, 8, 9, 10. A random sample from Group Blue has values 4, 8, 12, 16. Which group suggests generally greater values?

ANSWER _____

6 Sample C has values 30, 32, 34, 36. Sample D has values 31, 33, 33, 35. A student says Sample C is more consistent because its mean is lower. Is the student correct? Explain.

ANSWER _____

APPLY IT Show your work

1 Two school esports teams each chose a random sample of four members and recorded daily practice minutes. Team Nova's sample was 18, 20, 22, 24. Team Orbit's sample was 16, 20, 24, 28. What can you infer about typical practice time and consistency for the two teams?

WORK SPACE

ANSWER _____

2 Random samples of students from two robotics clubs recorded minutes spent building a robot after school. Club X recorded 30, 34, 38, 42. Club Y recorded 32, 35, 37, 40. Do the samples suggest that one club generally practices longer? Which club has more consistent practice times?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two streaming clubs take random samples of listening times, in minutes. Club A has 25, 25, 29, 29. Club B has 21, 27, 27, 33. A student claims Club A members usually listen longer. Is this claim supported by the samples? Use the means and MADs to explain.

WORK SPACE AND ANSWER

ANSWER KEY

Sample Showdown

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A random sample has values 4, 6, 8, 10. Find the mean.	**7**
2	A random sample has values 3, 5, 7, 9. Find the mean and MAD.	**Mean = 6; MAD = 2.**
3	Sample A has values 10, 12, 14. Sample B has values 6, 12, 18. Which sample has the higher mean, or are the means equal?	**The means are equal. Each mean is 12.**
4	Sample C has values 21, 22, 23, 24. Sample D has values 20, 22, 24, 26. Which sample is more consistent? Use MAD to support your answer.	**Sample C is more consistent. Its MAD is 1, and Sample D's MAD is 2.**
5	A random sample from Group Red has values 7, 8, 9, 10. A random sample from Group Blue has values 4, 8, 12, 16. Which group suggests generally greater values?	**Group Blue. Its mean is 10, compared with Group Red's mean of 8.5.**
6	Sample C has values 30, 32, 34, 36. Sample D has values 31, 33, 33, 35. A student says Sample C is more consistent because its mean is lower. Is the student correct? Explain.	**No. Both samples have a mean of 33. Sample D is more consistent because its MAD is 1, while Sample C's MAD is 2.**

PART 2 · APPLY IT

1. **Team Orbit suggests a slightly higher typical practice time because its mean is 22 minutes, compared with Team Nova's mean of 21 minutes. Team Nova is more consistent because its MAD is 2 minutes, compared with Team Orbit's MAD of 4 minutes.** Find each mean and MAD. Nova has mean 21 and MAD 2; Orbit has mean 22 and MAD 4.
2. **The samples do not suggest that one club generally practices longer because both means are 36 minutes. Club Y has more consistent practice times because its MAD is 2.5 minutes, compared with Club X's MAD of 4 minutes.** Both samples have a mean of 36. Compare MADs: Club X has MAD 4, and Club Y has MAD 5/2, or 2.5.

CHALLENGE

No. Both samples have a mean of 27 minutes, so the samples do not suggest that Club A usually listens longer. Club A has MAD 2, and Club B has MAD 3, so Club A's listening times are more consistent.

Accept equivalent forms for 2.5, including 5/2. Accept informal comparison statements that correctly use the sample means and MADs, including cautious language such as suggests or does not suggest.